To: jjimison@energyfuturecoalition.org[jjimison@energyfuturecoalition.org]
From: Hengst, Benjamin
Sent: Fri 8/16/2013 3:48:29 PM
Subject: Inquiry

Hi John—Greetings. Hope our cool summer is treating you well. Quick question for you: do you know anyone that works at the company Opower?

Regards, Ben

	2012 Corn Ethanol	2008 Corn Ethanol
Yield (anhydrous/undenatured, gallon/bushel)	2.82	2.78
Thermal Energy (Btu/gallon, LHV)	23,862	26,206
Electricity Use (kWh/gallon)	0.75	0.73
DDG Yield (dry basis) including corn oil (lbs/bu)	15.73	15.81
Corn Oil Separated (lbs/bushel)	0.53	0.11
Water Use (gallon/gallon)	2.70	2.72

To: Christopher Hessler[CHessler@ajw-inc.com]
From: Hengst, Benjamin
Sent: Tue 7/2/2013 10:05:59 PM
Subject: Re: RFS

Thanks.

From: Christopher Hessler
Sent: Tuesday, July 02, 2013 5:30:55 PM
To: Hengst, Benjamin
Subject: Re: RFS

Ben,
We are working furiously on it.
Not ready for prime time yet.
Chris

From: Hengst, Benjamin <Hengst.Benjamin@epa.gov>
To: Christopher Hessler
Sent: Tue Jul 02 15:58:18 2013
Subject: RFS

Chris – did you by any chance ever put out anything regarding RFS, RIN prices, and consumer impacts? Thanks, Ben

To: Chris Miller[cmiller@ajw-inc.com]
From: Hengst, Benjamin
Sent: Wed 6/26/2013 9:52:55 PM
Subject: Re: RFS hearing

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Not Lori Stewart -- Cheryl Mackay, in our Congressional office.

Probably the most civil E+Comm hearing I've seen. I think Upton asked folks to keep things cool.

From: Chris Miller
Sent: Wednesday, June 26, 2013 5:32:38 PM
To: Hengst, Benjamin
Subject: RFS hearing

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Was that Laurie Stewart sitting to your right?

Thanks, Chris

Christopher Miller, Partner
AJW, Inc.
202-296-8086
202-257-8691 cell
cmiller@ajw-inc.com

To: Chris Hessler[CHessler@ajw-inc.com]
From: Hengst.Benjamin@epa.gov
Sent: Mon 5/11/2015 4:57:36 PM
Subject: Re: Employees

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To: Hengst, Benjamin[Hengst.Benjamin@epa.gov]
From: Lindsay Fitzgerald
Sent: Mon 4/20/2015 10:48:03 PM
Subject: Re: Time to "pre-chat"? Before Thursday?

Sure, unless you have time for coffee. Larry and I will call you.

Sent from my iPhone

> On Apr 20, 2015, at 6:46 PM, Hengst, Benjamin <Hengst.Benjamin@epa.gov> wrote:
>
> Phone, right? Whomever you like.
>
>
>
>> On Apr 20, 2015, at 6:35 PM, Lindsay Fitzgerald <lfitzgerald@biodiesel.org> wrote:
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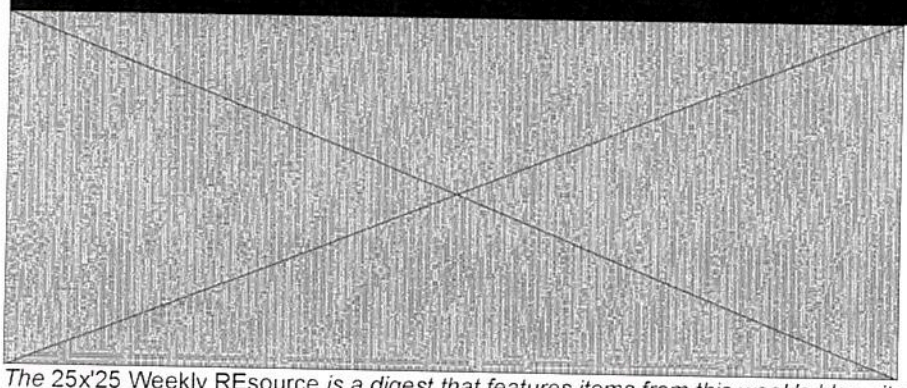
To: Hengst, Benjamin[Hengst.Benjamin@epa.gov]
From: 25x'25
Sent: Fri 4/17/2015 2:54:20 PM
Subject: Weekly REsource for April 17, 2015

Having trouble viewing this email? Click here

[redacted]



The 25x'25 Weekly REsource *is a digest that features items from this week's blog site, the* 25x'25 REsource, *and other sources. The* 25x'25 REsource *and the* 25x'25 Weekly REsource *complement the role of* 25x'25 *as an objective and trusted source of information on agricultural and forestry renewable energy and climate solutions. Also, visit us at our Facebook page and follow us on Twitter.*

[redacted]

Our Featured Blog

EIA Numbers Show 25x'25 Goal Remains Readily Obtainable

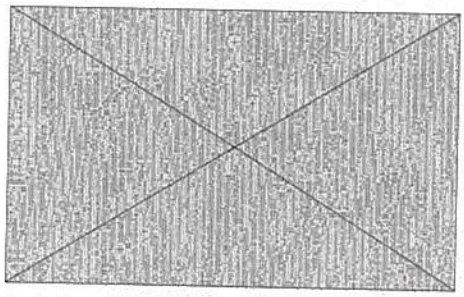
Given the resistance in some corners of Congress to the role of renewable energy in

Newsbot Note

Meeting the nation's energy needs, questions sometimes arise as to the progress being made toward the 25x'25 goal. However, due to a number of renewable energy technologies hitting what many analysts are calling a "turning point" - low costs coupled with wide availability - that signifies not only the acceptance but unstoppable growth in the energy market, the goal remains readily obtainable. The progress being made toward the goal was demonstrated with data recently released by DOE's Energy Information Administration (EIA) showing that in 2014, renewable energy sources accounted for 13.19 percent of net U.S. electrical generation, while in the transportation sector, the production of biofuels continue to trend high, even though progress was hindered by policy insecurity due to a lack of EPA finality on setting Renewable Fuel Standard requirements last year. Read more...

NREL: 80 Percent of U.S. Electricity Could Come from Renewables in 2050

A National Renewable Energy Laboratory (NREL) analysis shows electricity generation from renewable technologies that are commercially available today, in combination with a more flexible electric system, is more than adequate to supply 80 percent of total U.S. electricity generation in 2050. Furthermore, electricity generated from renewables can meet demand on an hourly basis in every region of the country.



Examining the extent to which renewable energy can meet the electricity demands of the continental United States over the next several decades, the study explores the implications and challenges of very high renewable electricity generation levels - from 30 percent up to 90 percent, focusing on 80 percent, of all U.S. electricity generation - in 2050.

In *Renewable Electricity Futures Study* (*RE Futures*), the NREL researchers acknowledge that at such high levels of renewable electricity generation, the unique characteristics of some renewable resources, specifically geographical distribution and variability and uncertainty in output, pose challenges to the operability of the nation's electric system.

However, the researchers say that increased electric system flexibility, needed to enable electricity supply and demand balance with high levels of renewable generation, can come from a portfolio of supply- and demand-side options, including flexible conventional generation, grid storage, new transmission, more responsive loads, and changes in power system operations.

Headlines of Note

News of interest to our 25x 25 Partners and advocates for a clean energy future:

At Last! EPA Proposes Timelines for Finalizing 2014, 2015, 2016 RFS Volumes

California Power Grid Seen Able to Handle 100% Renewables

Colorado's Big Coal-Burning Utilities Take a Turn to Renewable Energy

Cost-Competitive Geothermal Can Stimulate Economy

EIA Report: How Solar Will Help U.S. Become a Net Energy Exporter

Ethanol Advocates Encouraged After Clinton Expresses Support for Renewables

Hawaii Can Support 100 Percent Renewable Energy Goal, New Report Says

Measuring the Effects of Utility-Scale Solar Growth

Neb. Rep. Introduces Legislation to Increase Fuel Options for Consumers

New York's Smart Grid Research May Shape U.S.

Quad Cities Corn Processors Produce Millionth Gallon of Cellulosic Ethanol

Six Facts about the Impending Renewable Energy Revolution

Solar, Wind, Hydropower: Home Renewable Energy Installations

USDA Awards Funds to Expand, Accelerate Wood Energy, Wood Product Markets

USDA Helping Farmers Conserve Energy

The study also finds that the abundance and diversity of U.S. renewable energy resources can support multiple combinations of renewable technologies that result in deep reductions in electric sector greenhouse gas emissions and water use.

Also the direct incremental cost associated with high renewable generation is comparable to published cost estimates of other clean energy scenarios. The authors note that improvement in the cost and performance of renewable technologies is the most impactful lever for reducing this incremental cost.

RE Futures provides initial answers to important questions about the integration of high penetrations of renewable electricity technologies from a national perspective, focusing on key technical implications. The study explores electricity grid integration using models with unprecedented geographic and time resolution for the contiguous United States to assess whether the U.S. power system can supply electricity to meet customer demand on an hourly basis with high levels of renewable electricity, including variable wind and solar generation.

RE Futures, funded by DOE's Office of Energy Efficiency and Renewable Energy, is a collaboration with more than 110 contributors from 35 organizations, including national laboratories, industry, universities, and non-governmental organizations.

As the most comprehensive analysis of high-penetration renewable electricity of the continental United States to date, the study can inform broader discussion of the evolution of the electric system and electricity markets toward clean systems. *RE Futures* results indicate that renewable generation could play a more significant role in the U.S. electricity system than previously thought and that further work is warranted to investigate this clean generation pathway.

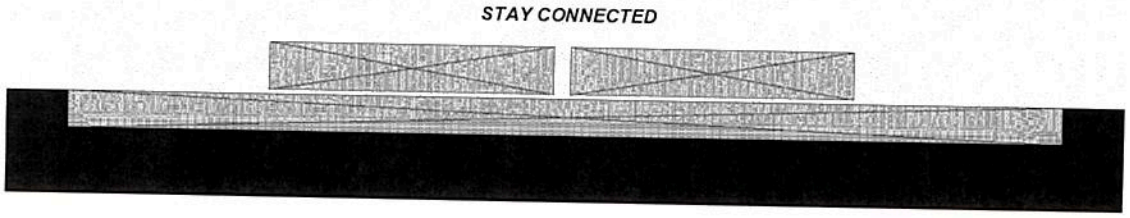
Upcoming Events

EIA: Renewables Can Play Big Role in Making U.S. a Net Energy Exporter

Register Now for Critical ACORE Energy Policy Forum April 22-23

The Annual Energy Outlook 2015 (AEO2015) released this week by DOE's Energy Information Administration (EIA) shows renewable energy can help make the United States a net energy exporter in the next five to 15 years. Achieving a balance in energy exports and imports would be a first since the 1950s.

25x'25 Sponsors



the AEO2015 Reference case and before 2020 in the high oil price and high oil and gas resource cases.

The outlook says significant net energy imports persist only in the low oil price and high economic growth cases, where U.S. supply is lower and demand is higher.

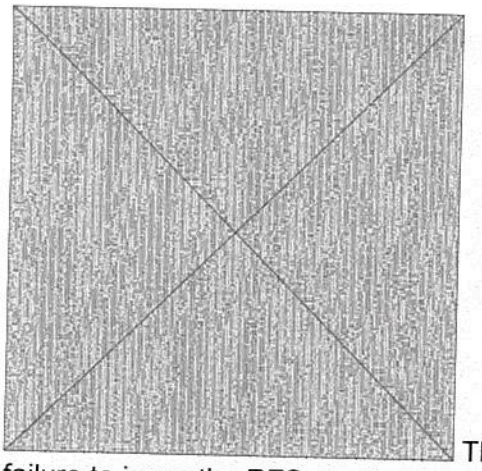
The analysis also shows technology and policy promote slower growth of energy demand. U.S. energy use grows at 0.3 percent per year from 2013 through 2040 in the reference case, far below the annual rates of economic growth (2.4 percent) and population growth (0.7 percent.

Decreases in transportation and residential sector energy consumption offset growth in other sectors. Declines in energy use reflect the use of more energy-efficient technologies as well as the effect of existing policies that promote increased energy efficiency. Fuel economy standards and changing driver behavior keep motor gasoline consumption below recent levels through 2040 in the reference case.

The AEO2015 cases generally reflect current policies, including final regulations and the sunset of tax credits under current law. Consistent with this approach, EPA's proposed Clean Power Plan rules for existing fossil-fired electric generating units or the effects of relaxing current limits on crude oil exports are not considered in the analysis.

EPA Sets Timeline to Propose, Finalize RFS Standards for 2014, 2015, 2016

Renewable Fuel Standard (RFS) biofuel blending requirements for 2014 and 2015 will be issued June 1 and finalized by Nov. 30, under a consent decree filed by EPA in a filed earlier this year lawsuit by the American Petroleum Institute (API) and the American Fuel and Petrochemical Manufacturers (AFPM).

 The two petroleum trade organizations said EPA's failure to issue the RFS requirements has hampered the ability of oil companies to fiscally plan in a responsible way

Though not a part of the consent decree, the agency also promised to propose the RFS volume requirements for 2016 by June 1 and finalize them by Nov. 30. The agency said it would also propose and finalize the RFS biomass-based diesel volume requirement for 2017 on the same schedule, and said the volume requirements for 2014 will reflect the volumes of renewable fuel that were actually used in 2014.

The EPA's announcement was generally received favorably in the biofuels industry, with most citing the "policy certainty" over blending requirements for ethanol and biodiesel producers have long waited for.

Advanced biofuel industry leaders have said the RFS must be maintained at strong levels to insure adequate investment in - and the assured development of - the next generation of sustainable fuels, like cellulosic ethanol.

"I am pleased to hear that the EPA has finally put a process in place to establish some certainty for biofuel producers," said Tom Buis, CEO of Growth Energy, a trade group representing ethanol manufacturers. "Our producers have faced ambiguity for too long and today is welcome news that they are establishing a level of certainty with this announcement.

"However, Buis said, "far more important than timing is that that the EPA establishes a final rule that moves our industry forward and reflects the bipartisan vision Congress intended for the RFS."

He said EPA's commitment to finalizing the 2016 RFS (renewable volume obligations) ensures that the RFS is back on a path to certainty for the biofuels industry, providing the necessary guidance for the industry to continue to thrive and advance alternative fuel options for American consumers."

The RFS has been under pressure from some in Congress who want to weaken it or repeal the 2007 measure entirely.

Bob Dinneen, president and CEO of the Renewable Fuels Association, said that "while we are sympathetic to the difficulty EPA faces in promulgating annual targets, the statute is clear about the volumes required and the agency simply has to do a better job moving forward. This consent agreement is a good start.

Brooke Coleman, executive director of the Advanced Ethanol Council, says the agreement between the oil industry and EPA "is actually a good signal for the advanced biofuels industry because it lays out a time frame and a reasonable market expectation for resolving the regulatory uncertainty around the RFS."

He also said advanced biofuel manufacturers were encouraged by EPA's decision late last year to pull a problematic 2014 proposal, stating his group is "optimistic that EPA will make the necessary adjustments and put the RFS back on track going forward."

The 2014 proposal that EPA proposed in late 2013 would have required refiners to blend only 15.21 billion gallons of renewable fuels into petroleum-based gasoline and diesel next year, a reduction of 2.95 billion gallons from the 2014 target set by a bipartisan vote of Congress in 2007, when lawmakers expanded the RFS through the Energy Independence and Security Act. The overall renewable fuel mandate proposed for this year is also considerably less than the total required in 2013. A lion's share of the proposed reduction would come in the corn ethanol requirement, which would drop from 14.4 billion gallons to a little more than 13 billion gallons, an amount even less than the 13.8 billion gallons required last year.

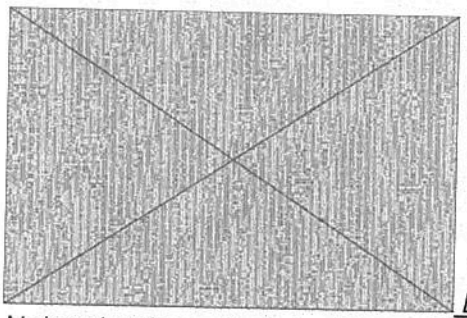
In addition to sharp criticism of the proposal from the corn ethanol industry, charges that EPA's plan would seriously harm production came from the biodiesel sector. The proposal would have kept the 2014 biodiesel requirement at about the same 1.28 billion gallons called for in 2013, despite the fact that U.S. producers generated an estimated 1.75 billion gallons in 2014.

"Clearly, ongoing questions will remain as to the volume levels proposed by EPA," said Anne Steckle, vice president for federal affairs with the National Biodiesel Board. "But EPA has reiterated that it 'will re-propose volume requirements for 2014, by June 1, that reflect the volumes of renewable fuel that were actually used in 2014.'"

She said EPA offering a commitment to "actual use" "appears to be a step in the right direction."

Study Shows Ethanol is a $5 Billion Industry in Nebraska

An impact study released this week by University of Nebraska-Lincoln economists reveals Nebraska's ethanol production capacity growth between 1995 and 2014 is tenfold and that the biofuel generates a $5 billion industry each year.



Economic Impacts of the Ethanol Industry in Nebraska shows that as of June 2014, Nebraska's production capacity was 2,077 million gallons per year with 1,301 full-time employees at 24 facilities. During the past five years, Nebraska's value of production for ethanol and dried distillers grain with solubles (DDGS) ranged from slightly under $4 billion to more than $6.6 billion, with the

last three years averaging close to $5 billion per year.

"The quantifiable economic impact of ethanol production on the Nebraska economy is clear," said Paul Kenney, chairman of the Nebraska Ethanol Board. "But we should also understand the enormous savings in health and environmental costs associated with displacing toxic petroleum products with cleaner burning biofuels like ethanol. Choosing ethanol fuels brings additional cost savings in terms of our health."

Nebraska's large ethanol production - it ranks second in the country, behind Iowa - results in 96 percent (1.805 billion gallons) being shipped out of state, making Nebraska one of the largest exporters of bioenergy. In addition, 58 percent of DDGS produced in 2014 were shipped out of state. These out-of-state shipments result in a net positive for the state and represent a direct economic impact by bringing new money into the state economy, the board says.

The study noted that Nebraska's ethanol industry could be affected by emerging trends and at least four are worth watching - the recovery of carbon dioxide (CO2), the extraction of corn oil, and world export markets for both ethanol and DDGS.

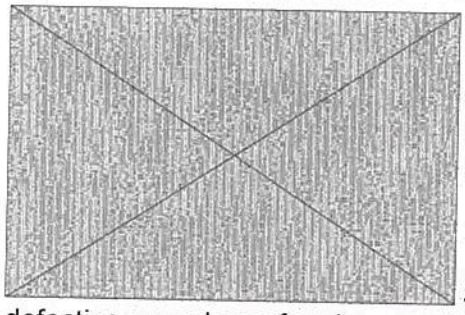
"Canada imports 40 percent of the U.S. ethanol exports and China imports 39 percent of the U.S. distillers grains," said Todd Sneller, Nebraska Ethanol Board administrator. "There is a strong demand throughout the world for ethanol and its co-products, so we continue to look for ways to expand the Nebraska market as well as international markets in an effort to bring more economic prosperity to Nebraska."

The purpose of the study was to estimate the value of production during five years and compare that value to major commodity production values in Nebraska. In addition, the study measured productive capacity, employment, net returns, in-state utilization and out-of-state shipments.

DOE Working to Assure Solar Modules Will Last for Decades

The DOE's National Renewable Energy Laboratory (NREL) is co-leading an

international push to assure the reliability of solar panels demanded by customers, manufacturers, lenders and utilities.



Solar photovoltaic (PV) systems affected by defective or underperforming panels is very low - just 0.1% per year according to new data of 50,000 systems analyzed by DOE's National Renewable Energy Laboratory. Installed between 2009 and 2013, the systems studied reported hardware problems occurring in only one percent each year. Inverter failures and fuse failures were reported more commonly than panel failure.

Despite hurricanes, hail, shading, vandalism, and hook-up delays, approximately 85% of all systems each year produced 90% or more of the electricity predicted, and the typical system produces more electricity than predicted. Year to year comparisons suggest that the degradation rate-the gradual loss of energy production-is in the historical range of 0.5%-1% per year.

But in the face of pressure to keep lowering prices, it is essential that quality be maintained and assured, said Sarah Kurtz, a Research Fellow at NREL who manages the lab's PV Module Reliability Test and Evaluation Group.

The International PV Quality Assurance Task Force (PVQAT) was formed in 2011 to develop standards to help customers quickly assess a PV product's ability to withstand regional stresses and gain confidence that purchased PV products will be of consistent quality in their design for specific conditions, in the manufacturing process and in system quality.

The goal for PVQAT is a quality assurance rating system that will identify module designs suitable for deployment in different climates, provide a valid basis for manufacturers' warranties, and provide investors with confidence in their investments. In

addition, the group aims to create guidelines for inspecting factories during module manufacturing.

At the recent 2015 Photovoltaic Reliability Workshop hosted by NREL, Wells Fargo Environmental Finance Banker Jon Previtali told the international gathering that 3.7 gigawatts of utility-scale solar were installed in the United States in 2014, a 10-percent increase from the previous year. In all, 10.6 gigawatts have been installed in the United States.

"You should be proud of that," Previtali, who also is an engineer, told the gathering. "That's the equivalent of 10 nuclear plants or 10 coal-fired power plants."

Previtali also noted that more banks are jumping into the solar market, and with the added competition comes diminished profits. That is why it is essential that investors, along with everyone else in the solar industry, know with maximum assurance how long the PV systems will last and what degree of degradation over time they can expect.

He noted that his bank faced decisions on advancing huge sums of money to two solar projects that had eleventh-hour problems with solar panel reliability. The bank assembled a team to set rules for fixing the problems and adjust the revenue projections based on the likelihood of lower overall energy output. But along the way, his team also learned the importance of putting every test requirement in writing-and being very specific. Requiring a test for infrared inspection isn't enough. It's important that the bank and the developer agree to the precise type of test-not, for example, an airplane flyover that falls far short of capturing the detailed images needed to identify a potential problem.

"All these areas I've highlighted are areas that your work influences, one way or another," Previtali told workshop attendees. "So the work you are doing is very material."

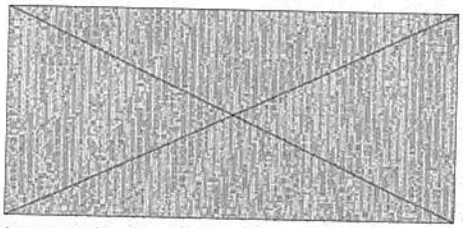
He said that in the future when his bank has concerns about performance ratio tests, he likely will turn to new work at NREL headed by Jordan on the methodology of calculating degradation rates. "I'm definitely going to share what I learned here today with my colleagues," he said. "The most important thing is to include new higher quality

standards in our contracts that module manufacturers and developers have to meet in order for us to sign on."

As the focus in the PV industry is shifting away from pure growth, NREL and its partners around the world are addressing the critical needs of reliability and durability of modules, NREL's Kurtz said. "Reliability has become an even more central issue."

Development Firms Help Texas Utility to Complete Innovative Microgrid

Oncor, an electric transmission and distribution company serving 10 million customers across Texas has unveiled this week what its developers call one of the most advanced microgrids in North America.



S&C Electric Company, a smart grid developer, teamed with Schneider Electric, an energy management firm, to develop the microgrid, which is engineered to maximize newly installed energy storage, renewable generation and improve reliability.

S&C and Schneider Electric combined new hardware and software technologies for the state-of-the-art facility, which includes an integrated demonstration center for Oncor to showcase the microgrid's advanced capabilities and customer benefits. (To watch a video and learn more about Oncor's microgrid, click HERE.

S&C and Schneider Electric built the microgrid at Oncor's System Operating Services Facility near Lancaster, in Central Texas. The system consists of four interconnected microgrids and utilizes nine different distributed generation sources, including two solar photovoltaic arrays, a microturbine, two energy storage units and four generators.

To turn the diverse generation assets into a microgrid, S&C and Schneider Electric developed a distribution automation scheme that leverages multiple intelligent grid solutions from both companies - enabling the four microgrids to effectively operate independently or as one larger microgrid.

"Improving power reliability and optimizing generation assets requires disruptive technologies that allow customers to work on and off the grid," says David Chiesa, director of Microgrid Business Development with S&C. "Oncor's microgrid is showing the world how utilities can help their communities in the future.'

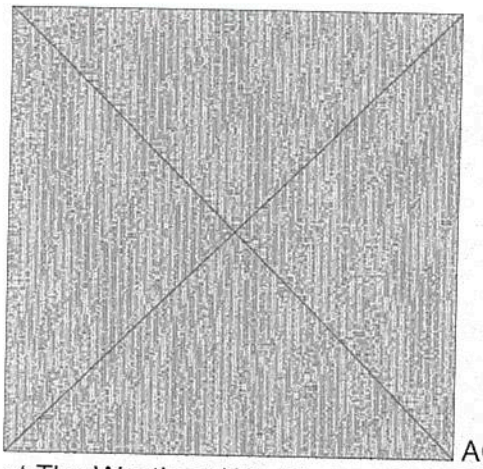
During a loss-of-power event, a combination of S&C's Distribution automation equipment and Schneider Electric's Microgrid Controller (MGC) use high-speed communications and distributed grid intelligence to automatically detect a problem on the grid. It starts with S&C's proprietary fault interrupter, which detects an interruption in power, tests to see if the issue is temporary or permanent, and if it is permanent dynamically islands the facility. The system then uses S&C's proprietary switches and switchgear to automatically re-configure the distribution system while the MGC autonomously switches to alternative distributed power sources.

"It does all of this in a matter of seconds, or faster than a customer could find their flashlight in the dark," says Chiesa.

Energy storage systems are the backbone of the microgrid. The onsite storage - which stores energy from either the utility feed or any of the facility's generation sources - provides the voltage signal for the site, enables renewable integration, controls the microgrid frequency and is the first generating source to respond during an unexpected loss of power.

Why 2015 Could Be Record Year for the Greening of U.S. Energy

Join the renewable energy industry next week in Washington as it mobilizes key policymakers and federal and state stakeholders to deliberate, develop and advance the critical near and long-term policy priorities that will motivate the President in his last two years in office, the new Congress, state leaders, and the emerging slate of 2016 Presidential candidates.



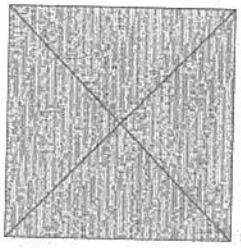
ACORE's Policy Forum, which is set for April 22-23 at The Westin at Washington, D.C. City Center, champions the progress of the industry in reducing costs and deploying at scale, and will feature policymakers, industry leaders and other perspectives to outline challenges and highlight opportunities facing the sector.

The Forum will drive bipartisan renewable energy policy priorities and strategy for the next two years, setting up a successful long-term outlook for the industry. The outcome of the Forum - the policy agenda for renewable energy policy - will be shared with the President and Congress, as well as governors, legislators, and regulators in the states.

Use 20-percent discount code SPT2025and

REGISTER TODAY at www.acorepolicyforum.com

East Tennessee Clean Fuels Continues Webinar Series April 21



East Tennessee Clean Fuels has two remaining webinars left in an ongoing series, including the next one Tuesday, April 21, which will feature a biodiesel

success story from New York City's Department of Citywide Administrative Services.

Biodiesel Successes and Winter Treatments in NYC

- Presented by Keith Kerman, Chief Fleet Officer/Deputy Commissioner
- April 21, 2015
- **12 pm CT, 1 pm ET**
- When it's time, join the webinar directly here. You may use your computer's speakers and microphone to listen and pose questions, or dial in:
  - Call line: 415-655-0001
  - Access code: 199 412 493

The final webinar in the series is set for the following Tuesday, April 28, featuring a biofuels urban success story.

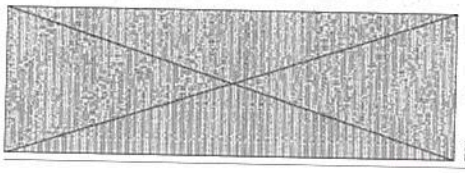
Biofuels Success Story: Fort Wayne, Indiana

- Presented by Larry Campbell, CPFP, Director of Fleet Management, City of Fort Wayne, Indiana
- April 28, 2015
- **8:30 a.m. CT, 7:30 a.m. ET**
- When it's time, join the webinar directly here. You may use your computer's speakers and microphone to listen and pose questions, or dial in:
  - Call line: 415-655-0001
  - Access code: 199 412 493

Visit ET Clean Fuel's biofuels webinar page more information and a full list of dates and topics. The next webinar will be one week later on April 28.

Speakers Confirmed for NDARE Solar Event

The North Dakota Alliance for Renewable Energy is pleased to announce that ND Public Service Commission Chair Julie Fedorchak will offer remarks as part of the upcoming ND Solar Workshop, scheduled for 1-4:30 p.m. Tuesday, May 12, at the ND Association of Rural Electric Cooperatives Ulmer Center in Mandan.



In addition, to Fedorchak, local and community solar

planning expert Brian Ross and LSU Ag Center Extension Housing Specialist Claudette Reichel will be speaking.

A finalized agenda will soon be available.

To register for the workshop, click here. Space is limited.

Other events of interest to 25x'25 partners and other renewable energy stakeholders can be found by clicking **here**.

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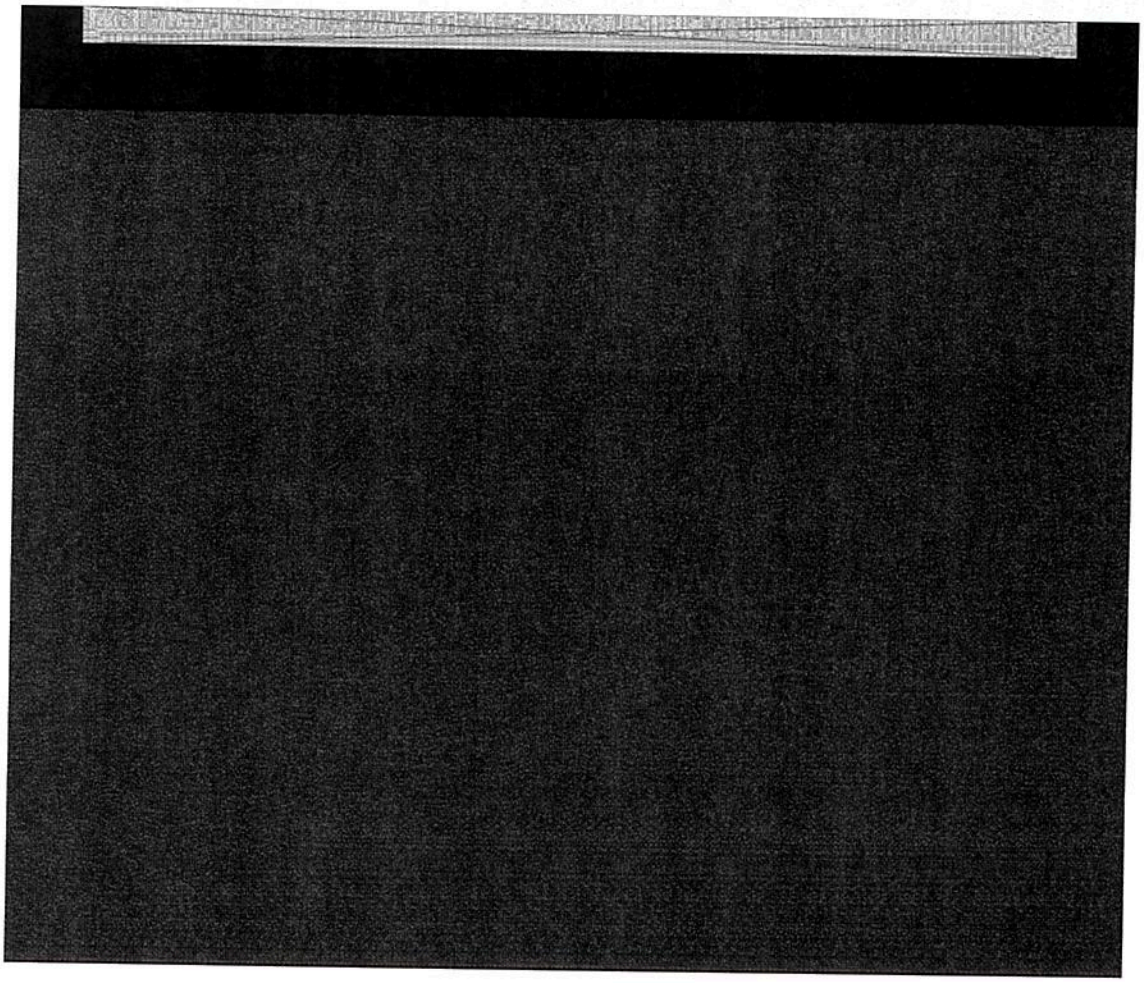

To: Hengst, Benjamin[Hengst.Benjamin@epa.gov]
From: Lindsay Fitzgerald
Sent: Mon 4/20/2015 10:48:03 PM
Subject: Re: Time to "pre-chat"? Before Thursday?

Sure, unless you have time for coffee. Larry and I will call you.

Sent from my iPhone

> On Apr 20, 2015, at 6:46 PM, Hengst, Benjamin <Hengst.Benjamin@epa.gov> wrote:
>
> Phone, right? Whomever you like.
>
>
>
>> On Apr 20, 2015, at 6:35 PM, Lindsay Fitzgerald <lfitzgerald@biodiesel.org> wrote:
>>
>> Me and Larry???
>>
>> Sent from my iPhone
>>
>>> On Apr 20, 2015, at 5:51 PM, Hengst, Benjamin <Hengst.Benjamin@epa.gov> wrote:
>>>
>>> 9:30 am on Weds work?
>>>
>>>
>>>
>>>> On Apr 20, 2015, at 5:24 PM, Lindsay Fitzgerald <lfitzgerald@biodiesel.org> wrote:
>>>>
>>>>
>>>>
>>>> Sent from my iPhone

To: Hengst, Benjamin[Hengst.Benjamin@epa.gov]
From: Lindsay Fitzgerald
Sent: Mon 4/20/2015 10:35:17 PM
Subject: Re: Time to "pre-chat"? Before Thursday?

Me and Larry???

Sent from my iPhone

> On Apr 20, 2015, at 5:51 PM, Hengst, Benjamin <Hengst.Benjamin@epa.gov> wrote:
>
> 9:30 am on Weds work?
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>>
>>
>>
>> Sent from my iPhone

To: Hengst, Benjamin[Hengst.Benjamin@epa.gov]
From: Lindsay Fitzgerald
Sent: Mon 4/20/2015 9:24:40 PM
Subject: Time to "pre-chat"? Before Thursday?

Sent from my iPhone

To: Hengst, Benjamin[Hengst.Benjamin@epa.gov]
From: Chris Hessler
Sent: Fri 3/13/2015 7:48:26 PM
Subject: FYI
removed.txt
image002.jpg

Ben,
Just wanted to be sure you were aware of what Brian submitted to Biofuels Digest. Hope folks in your office find it helpful.
Chris
http://www.biofuelsdigest.com/bdigest/2015/03/11/managing-the-conundrum-of-the-cellulosic-biofuel-rvo/

Managing the Conundrum of the Cellulosic Biofuel RVO<http://www.biofuelsdigest.com/bdigest/2015/03/11/managing-the-conundrum-of-the-cellulosic-biofuel-rvo/>
March 11, 2015 | Jim Lane<http://www.biofuelsdigest.com/bdigest/author/jmldigest/>
[foody]By Brian Foody
After a long period of limited production, cellulosic biofuels are finally starting to flow into the market. Renewable natural gas and cellulosic ethanol production facilities are operating and some are approaching commercial production volumes. These fuels generate D3 (cellulosic) RINs (Renewable Identification Numbers), which are used by obligated parties for managing their compliance under the Renewable Fuel Standard (RFS). The emergence of commercial cellulosic biofuel production is a signal of the success of the RFS.
However, the outlook for cellulosic biofuels investment is clouded by uncertainty about the low value of D3 RINs. Market trading of RINs is intended to ease compliance for obligated parties while also conveying a price signal to renewable fuel producers, thereby attracting new fuel to market. But with cellulosic production still far below hoped-for levels, D3 RINs should be - but are not - fetching significant premiums.
Further, as cellulosic biofuel investors look to the future, the procedure for setting the cellulosic Renewable Volume Obligation (RVO) depends on EPA making a quantitative call about an uncertain future. Everybody knows this is a difficult task; EPA could just as easily overshoot as undershoot.
But there is an asymmetry in how this affects the value of cellulosic RINs. If EPA's production volume estimate is too high, it issues Cellulosic Waiver Credits (CWCs) to obligated parties, protecting them from unanticipated upward price shocks. If EPA's estimates are too low, D3 RIN premiums could crash due to oversupply. There is a 20% supply carry-over allowance, but that percentage could easily be surpassed. Unfortunately, this is a formula for harmful market uncertainty.
And if that is not enough, EPA must make Cellulosic Waiver Credits available to obligated parties as an alternative to buying real credits generated with real cellulosic biofuels. The waiver credits were intended to ensure liquidity in the market and to offer a functional price cap in the event of short supply. When EPA issues waiver credits to obligated parties when there is ample supply of D3 RINs available, it will find itself circumventing its own process for setting cellulosic RVOs, creating a surplus of cellulosic biofuel over the obligation. This will generate "stranded fuel" and exacerbate market uncertainty and the downward price pressure that can only stall investment.

A Solution:

Everyone should recognize that EPA is working hard to faithfully implement the RFS, and that their efforts have too often been confounded by outside political forces. At the same time, we believe that EPA can provide much greater certainty to both producers and obligated parties, as EISA requires - and substantially reduce the stakes and the controversy that surrounds its cellulosic biofuel volume projections. EPA could, for example, signal its intent to deal with any annual surplus (or shortfall) that may occur in the availability of cellulosic biofuel relative to any given year's RVO by:
1. Including the surplus amount (or shortfall) in its estimates of the projected volume available during the subsequent calendar year;
2. Adjusting the following year RVO by the amount of CWCs issued to reflect the additional fuel this

would make available to the market; and
3. Increasing or removing the 20% limit on the use of prior year RINs for meeting cellulosic biofuel renewable volume obligations.

In addition, EPA could develop mechanisms to ensure that CWCs are issued only when there is evidence of an absence of D3 RIN availability, preserving market liquidity but avoiding the creation of "stranded fuel."

EPA is empowered to make these procedural changes; they offer a way to accelerate the development of cellulosic biofuels and meet the intent of EISA. Both producers and obligated parties would know that every gallon of cellulosic biofuel produced would be required for compliance and that any overestimates of production would be corrected. Market volatility would be limited to ordinary market forces, the price outlook for cellulosic D3 RINs would be stabilized, D3 RIN markets would have increased transparency and liquidity, and the prospects for further cellulosic biofuel investment would improve. No legislative change to EISA is required.

Without such a solution, we can anticipate a high level of uncertainty about whether demand will match supply and an appropriate value will be conveyed for producing D3 RINs. EPA may be tempted to delay addressing this issue, but failing to resolve the uncertainty inherent in the current RVO process will only prolong the current period of malaise in the D3 RIN market. Savvy investors and other market participants will remain largely on the sidelines until stable, durable, and transparent market conditions can be established by EPA.
Brian Foody is the CEO of logen Corporation. The first commercial-scale plant using logen's cellulosic ethanol production technology finished construction on schedule in 4Q 2014 in Sao Paulo, Brazil. Production at that facility will begin with the spring harvest season, and increase to full capacity during 2015.

[LR Paris Home]<http://ajw-inc.com/>

Christopher Hessler | Partner | AJW, Inc.
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M: 202.460.0945
E: chessler@ajw-inc.com<mailto:chessler@ajw-inc.com>
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Arlington, VA 22201
ajw-inc.com<http://ajw-inc.com/>

AJW's work focuses on enhancing market opportunities and removing market barriers for innovative technologies.

To: Hengst, Benjamin[Hengst.Benjamin@epa.gov]
From: Chris Hessler
Sent: Tue 3/10/2015 6:27:56 PM
Subject: RE: RVOs

Ben,
Anytime Friday afternoon would be fine for me. Thanks.
Chris

-----Original Message-----
From: Hengst, Benjamin [mailto:Hengst.Benjamin@epa.gov]
Sent: Monday, March 09, 2015 9:23 PM
To: Chris Hessler
Subject: Re: RVOs

Tues-Thurs are bad for me, unless you want to talk at night. Would Friday after noon at some point work?

From: Chris Hessler <CHessler@ajw-inc.com>
Sent: Monday, March 9, 2015 1:48 PM
To: Hengst, Benjamin
Subject: RVOs

Ben,
Can we schedule a 15 minute call sometime this week? I want to share some info and briefly follow up on our discussion about the RVO issue.
Chris

[LR Paris Home]<http://ajw-inc.com/>

Christopher Hessler | Partner | AJW, Inc.
T: 202.296.8086
M: 202.460.0945
E: chessler@ajw-inc.com<mailto:chessler@ajw-inc.com>
2200 Wilson Blvd, Suite 310
Arlington, VA 22201
ajw-inc.com<http://ajw-inc.com/>

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To: Hengst, Benjamin[Hengst.Benjamin@epa.gov]
From: Chris Hessler
Sent: Mon 3/9/2015 5:48:22 PM
Subject: RVOs
removed.txt

Ben,
Can we schedule a 15 minute call sometime this week? I want to share some info and briefly follow up on our discussion about the RVO issue.
Chris

[LR Paris Home]<http://ajw-inc.com/>

Christopher Hessler | Partner | AJW, Inc.
T: 202.296.8086
M: 202.460.0945
E: chessler@ajw-inc.com<mailto:chessler@ajw-inc.com>
2200 Wilson Blvd, Suite 310
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ajw-inc.com<http://ajw-inc.com/>

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To: Chris Hessler[CHessler@ajw-inc.com]
From: Chris Hessler
Sent: Fri 3/6/2015 8:51:14 PM
Subject: FW: AJW is looking for talent
removed.txt
150303 AJW job posting.pdf

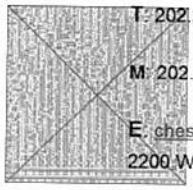
AJW is looking to hire a capable and energetic individual to join our team. If you happen to know any bright young person looking for a new career challenge, please share our job posting with them (pdf attached & link below). The perfect candidate would share many of your professional traits, but would be at the early end of her or his career.

(Apologies for the group email.)

Chris

http://www.rcjobs.com/jobseeker/job/22402147/Legislative,%20regulatory,%20and%20public%20policy%20as

Christopher Hessler | Partner | AJW, Inc.



T: 202.296.8086

M: 202.296.0945

E: chessler@ajw-inc.com
2200 Wilson Blvd, Suite 310

Arlington, VA 22201
ajw-inc.com
AJW's work focuses on enhancing market opportunities and removing market barriers for innovative technologies.

To: Larry Schafer[Lschafer@biodiesel.org]
Cc: Stewart, Gwen[Stewart.Gwen@epa.gov]; Hengst, Benjamin[Hengst.Benjamin@epa.gov]; Anne Steckel[asteckel@biodiesel.org]
From: Argyropoulos, Paul
Sent: Mon 3/2/2015 6:58:40 PM
Subject: Re: Meeting Request

Hi Larry,

Due to uncertainties with a number of things on our end, we are still looking to confirm when Chris is in town. Also, you have the additional request for Chris' participation in your board meeting we have to resolve as well. We may just need to schedule something in anticipation of Chris' availability and hope that it works. I will still need to get with Gwen to identify the best potential date and then make sure others are available to meet as well.

I or Gwen will get back with you in the next day or two.
Thanks, Paul

From: lschafer@dcdiamondgroup.com <lschafer@dcdiamondgroup.com> on behalf of Larry Schafer <Lschafer@biodiesel.org>
Sent: Monday, March 2, 2015 1:53 PM
To: Argyropoulos, Paul
Cc: Stewart, Gwen; Hengst, Benjamin; Anne Steckel
Subject: Re: Meeting Request

Paul, Gwen and Ben

Hope you are well and that you had a good weekend.

I am checking in to get on your short list for a meeting with Chris and Anne.

Please keep us posted.

Thank you.

==========

Larry Schafer

t: 202.997.8072

==========

On Feb 19, 2015 7:50 PM, "Argyropoulos, Paul" <Argyropoulos.Paul@epa.gov> wrote:

Larry and Anne,

I have been working with Gwen in an attempt to squeeze in a meeting next week but unfortunately it is simply not possible.

Chris has been on travel this week and is only in DC 2 days next week and is wall to wall with meetings. He will then be on travel until Mid-March. As it stands now that is the only time table we are working with. Gwen and I will look to offer some options and provide them to you next week.

Thanks, Paul

Paul Argyropoulos
Senior Policy Advisor
USEPA
Office of Transportation and Air Quality
Office: 202-564-1123
Mobile: 202-577-9354

To: Hengst, Benjamin[Hengst.Benjamin@epa.gov]
From: Chris Hessler
Sent: Tue 2/24/2015 11:15:33 PM
Subject: Re: Time on Thursday?

Will do. And Miller is available.

On Feb 24, 2015, at 5:52 PM, Hengst, Benjamin <Hengst.Benjamin@epa.gov> wrote:

> Ok. Let me confirm but let's pencil it in.
>
> On Feb 24, 2015, at 4:46 PM, Chris Hessler <CHessler@ajw-inc.com> wrote:
>
> > Yes. I can be there for sure. Chris M. may not be able to, but he will try to change a meeting.
> > Thanks.
> >
> > On Feb 24, 2015, at 12:47 PM, Hengst, Benjamin <Hengst.Benjamin@epa.gov> wrote:
> >
> > > Chris –
> > >
> > > Could you come in for a meeting on Thursday at 3pm? Chris G would be on video from AA, but at least we could talk soon (he's out on vacation in early March).
> > > Let me know. Ben

To: Hengst, Benjamin[Hengst.Benjamin@epa.gov]
From: Chris Hessler
Sent: Tue 2/24/2015 9:46:34 PM
Subject: Re: Time on Thursday?

Yes. I can be there for sure. Chris M. may not be able to, but he will try to change a meeting. Thanks.

On Feb 24, 2015, at 12:47 PM, Hengst, Benjamin <Hengst.Benjamin@epa.gov> wrote:

> Chris –
>
> Could you come in for a meeting on Thursday at 3pm? Chris G would be on video from AA, but at least we could talk soon (he's out on vacation in early March). Let me know.
> Ben

To: Hengst, Benjamin[Hengst.Benjamin@epa.gov]
From: Chris Hessler
Sent: Mon 2/23/2015 11:21:05 PM
Subject: Meeting

Hey -- if it makes life any easier, we could meet Chris for dinner this week.
Chris

To: Hengst, Benjamin[Hengst.Benjamin@epa.gov]
From: Chris Hessler
Sent: Mon 2/23/2015 6:47:14 PM
Subject: Thanks

Ben,
Thanks for making time for lunch and a great discussion.

Please remember to give Cat all my best.

Chris

To: Hengst, Benjamin[Hengst.Benjamin@epa.gov]
From: Chris Hessler
Sent: Mon 2/23/2015 1:59:36 PM
Subject: RE: lunch

Thought I replied, but it is entirely possible that I did not.

Today is good. Let's do it while we both can.

I will be coming from Arlington, but I am happy to go anyplace that works for your schedule/palate.

Chris

From: Hengst, Benjamin [mailto:Hengst.Benjamin@epa.gov]
Sent: Monday, February 23, 2015 8:56 AM
To: Chris Hessler
Subject: RE: lunch

Sure—hadn't heard back (or did I miss it). Can you meet downtown? Could also do lunch Friday if that's easier. Your choice.

As to where…where will you be coming from? Arlington?

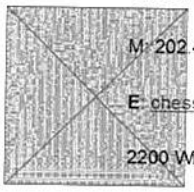
From: Chris Hessler [mailto:CHessler@ajw-inc.com]
Sent: Monday, February 23, 2015 8:50 AM
To: Hengst, Benjamin
Subject: lunch

Ben,

Are we still good for lunch today? If so, where would you like to meet/eat?

Chris

Christopher Hessler | Partner | AJW, Inc.
T: 202.296.8086



M: 202.460.0945

E: chessler@ajw-inc.com

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Arlington, VA 22201

ajw-inc.com

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To: Hengst, Benjamin[Hengst.Benjamin@epa.gov]
From: Chris Hessler
Sent: Mon 2/23/2015 1:49:37 PM
Subject: lunch
removed.txt

Ben,

Are we still good for lunch today? If so, where would you like to meet/eat?

Chris

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To: Larry Schafer[lschafer@biodiesel.org]; Anne Steckel[asteckel@biodiesel.org]
Cc: Stewart, Gwen[Stewart.Gwen@epa.gov]; Hengst, Benjamin[Hengst.Benjamin@epa.gov]
From: Argyropoulos, Paul
Sent: Fri 2/20/2015 12:50:11 AM
Subject: Meeting Request

Larry and Anne,

I have been working with Gwen in an attempt to squeeze in a meeting next week but unfortunately it is simply not possible.

Chris has been on travel this week and is only in DC 2 days next week and is wall to wall with meetings. He will then be on travel until Mid-March. As it stands now that is the only time table we are working with. Gwen and I will look to offer some options and provide them to you next week.

Thanks, Paul

Paul Argyropoulos
Senior Policy Advisor
USEPA
Office of Transportation and Air Quality
Office: 202-564-1123
Mobile: 202-577-9354

To: Hengst, Benjamin[Hengst.Benjamin@epa.gov]
From: Lindsay Fitzgerald
Sent: Thur 2/12/2015 2:55:46 PM
Subject: question for you...

If you have 2 minutes for a call today or tomorrow I have a question about a 4 letter word that starts with "p" and ends with "alm" ☺

Hope all is well with munchkin #3!

Lindsay

To: Hengst, Benjamin[Hengst.Benjamin@epa.gov]
From: Chris Hessler
Sent: Thur 1/15/2015 3:28:54 PM
Subject: schedule
removed.txt

Ben,

Any thoughts on what day might work to get together?

Chris

Christopher Hessler | Partner | AJW, Inc.
T: 202.296.8086
M: 202.460.0945
E: chessler@ajw-inc.com
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ajw-inc.com
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To: Hengst, Benjamin[Hengst.Benjamin@epa.gov]
From: necregistration@ethanolrfa.org
Sent: Wed 1/14/2015 2:27:22 PM
Subject: National Ethanol Conference - Registration Confirmation

20th Annual National Ethanol Conference
February 18 - 20, 2015
Gaylord Texan Resort & Convention Center
Grapevine, Texas

Thank you for registering for the 2015 National Ethanol Conference.
We look forward to seeing you in Grapevine!

If you have any questions please call (866) 497-1232 (US) or (303) 586-4751 (International) or e-mail to necregistration@ethanolrfa.org.

Registration Details

This registration confirmation is for: **Benjamin Hengst**
Your password is:

To view details of your registration, **click here**

RFA Smartbrief

RFA Smartbrief keeps readers ahead of the curve with up to-date news on events and updates in the ethanol industry regarding technology, policy, and industry leadership. Click **HERE** to sign up.

Hotel Accommodations

This year's National Ethanol Conference will be held at the **Gaylord Texan Resort & Convention Center**.

All events will be centrally located at the Gaylord Texan Resort & Convention Center. Please support the National Ethanol Conference by booking your room through the NEC room block. Staying in the room block helps offset the cost of meeting space and many other expenses associated with meetings, and decreases the association's exposure to financial and other penalties due to contractual obligations.

Click HERE to book your room or call 817-778-1000 and refer to the National Ethanol Conference to receive the specially negotiated NEC rate of $215/night. The deadline to reserve your room at this rate is Friday, January 30, 2015. There is limited inventory at this advance rate, so book your reservations early. Once the NEC inventory is full, guest rooms will be subject to hotel availability at prevailing non-discounted rates.

Confirmation: Once you submit your hotel reservation, you will receive an e-mail confirmation with the charges to appear on your credit card. If you do not receive this e-mail, please notify the Gaylord Texan Resort & Convention Center at 817-778-1000.

Conference Cancellation Policy

Requests for a registration refund must be submitted in writing.

E-mail: necregistration@ethanolrfa.org.

A service charge of $100 will be applied to all registration refund requests. No refunds will be granted after January 30, 2015.
</span

To: Hengst, Benjamin[Hengst.Benjamin@epa.gov]
From: Chris Hessler
Sent: Tue 1/13/2015 3:17:33 PM
Subject: Re: Startup in Brazil

Except for this Friday, I am around all month. Let me know what works so I can pencil something in.
Chris

On Jan 9, 2015, at 3:23 PM, Hengst, Benjamin <Hengst.Benjamin@epa.gov> wrote:

Yeah,I've been reading about that in the press. Good stories.

Getting together sounds good but the next few weeks are shot. Perhaps later in month?

[redacted]

Ben,

Thought you might be interested in the attached stories. Let me know when we can grab a beer.

Chris

Christopher Hessler | Partner | AJW, Inc.
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E: chessler@ajw-inc.com
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Arlington, VA 22201
ajw-inc.com

AJW's work focuses on enhancing market opportunities and removing market barriers for innovative technologies.

To: Hengst, Benjamin[Hengst.Benjamin@epa.gov]
From: Chris Hessler
Sent: Fri 1/9/2015 8:31:30 PM
Subject: Re: Startup in Brazil

Name your day.

On Jan 9, 2015, at 3:23 PM, "Hengst, Benjamin" <Hengst.Benjamin@epa.gov> wrote:

Yeah,I've been reading about that in the press. Good stories.

Getting together sounds good but the next few weeks are shot. Perhaps later in month?

[redacted]

Ben,

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Chris

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Raizen, logen commence c..pdf
logen announces startup ...pdf

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Raizen, Iogen commence cellulosic ethanol production in Brazil

December 17, 2014 | Jim Lane

1 billion liters by 2024, vows Raizen. Record speed on start-up. What's the story on the ground? The Digest investigates.

In Brazil, Iogen and Raizen announced they have begun production of cellulosic ethanol on schedule at Raizen`s newly expanded Costa Pinto sugar cane mill in Piracicaba, São Paulo, Brazil.

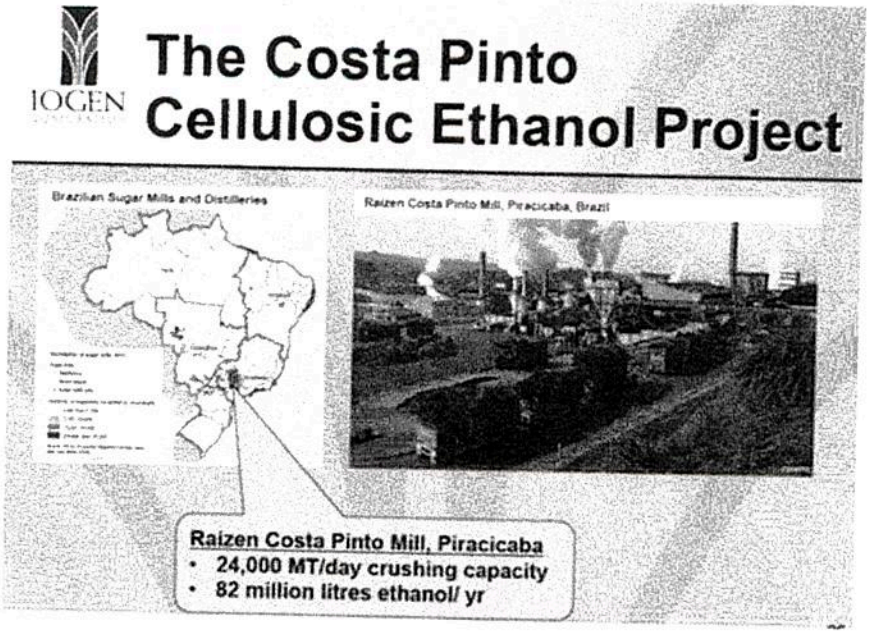
Raízen broke ground on the $US100 million "biomass-to-ethanol" expansion just over one year ago. The new facility will convert biomass such as sugar cane bagasse and straw into 40 million litres per year of advanced, second generation cellulosic biofuel. It will also be the first large-scale commercial implementation of Iogen Energy's cellulosic ethanol technology, which the company developed and has extensively proven in its Ottawa demonstration facility.

From the Front Lines

"We finished construction on schedule, and said we expected a Q4 startup, and we're on time," said Ziyad Rahme, SVP and General Manager for logen Energy. "We've had a short one-month ramp up, and started production and are making ethanol. Raizen right now have made 200,000 liters available and are selling cellulosic ethanol in Brazil. That's also very exciting."

How did it go, seen on the ground?

"The start up went very well," Rahme said. "There are always the first of kind things. But our strategy was to focus on validating the technology – all with the express goal of having quick start up.. So we're running in continuous mode right now as we speak."



The ramp up to full production

"We're getting very near the end of the harvest season," said Rahme. "We'll probably have one or two more weeks of run time, and then we'll shut down as the harfvest comes to an end. That will wrap up the shakedown period – with a resumption in April or May of next year, when we ramp to full capacity.

Any shortfalls on rate or yield?

We are not hitting any significant hurdles, so far on the rate or yield side. What we are seeing is as per expectation, the pretreatment, hydrolysis and fermentation are all working as expected. Having said that there is always continuous improvement and fine tuning the process."

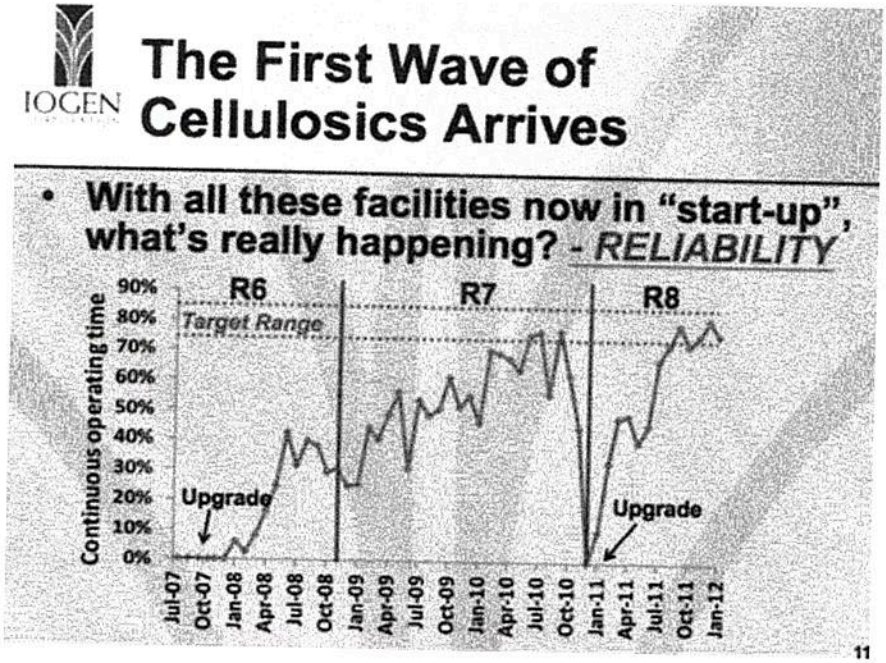
Reaction from the partners

"Biofuel production at this facility represents the next step in our partnership with Iogen," says João Alberto Abreu, agroindustrial director from Raizen. "We believe Iogen Energy has the most robust, well proven, and competitive technology platform in the cellulosic ethanol business. We see tremendous potential for this to meet the world's growing demand for cleaner and more sustainable fuels, and we anticipate a long and profitable future."

"We are very excited to have been able to make this start-up a success" says Brian Foody CEO of Iogen Corporation. "We have a great team of engineers, scientists and operators who've been working tirelessly with Raízen's own excellent team. It has been a great partnership and we're very pleased to be collaborating with a major ethanol industry player and committed partner like Raízen. Large scale commercialization in Brazil will open the door for global deployment of our technology."

"Continuous commercial production will commence with the upcoming 2015 harvest season," says Pedro Mizutani, Raízen's Executive Vice President. Raízen has already announced that, given a success at Costa Pinto, it intends to deploy Iogen Energy`s technology in seven more Raízen sugar cane mills. "We plan to be producing up to 1 billion liters of cellulosic biofuel from bagasse and cane straw by 2024," says Mizutani.

The Raizen ambition



In June 2012, Raizen announced that it would invest $7 billion in a program to reach 100 billion tonnes in cane crushing capacity, a 50 percent increase over current capacity. At the time, Raizen exec VP Pedro Mizutani said that the company, which now has 10 percent of the cane crushing capacity in Brazil, would increase production by 5 million tonnes at its current plants, and achieve the remainder of growth through new project, as well as acquisitions.

Raízen`s initial commitment to Iogen came in July 2012, after Raízen concluded that Iogen Energy had the most advanced cellulosic biofuels technology, ideally suited for building co-located commercial plants at Raizen's sugar cane ethanol facilities.

"The technology being deployed has undergone extensive testing and validation work," says Foody. "We have ten years of demonstration scale operating experience, and by operating over 6 months with Brazilian bagasse, we were able to troubleshoot problems, collect information, and adapt designs for reliable low-cost operation in Brazil."

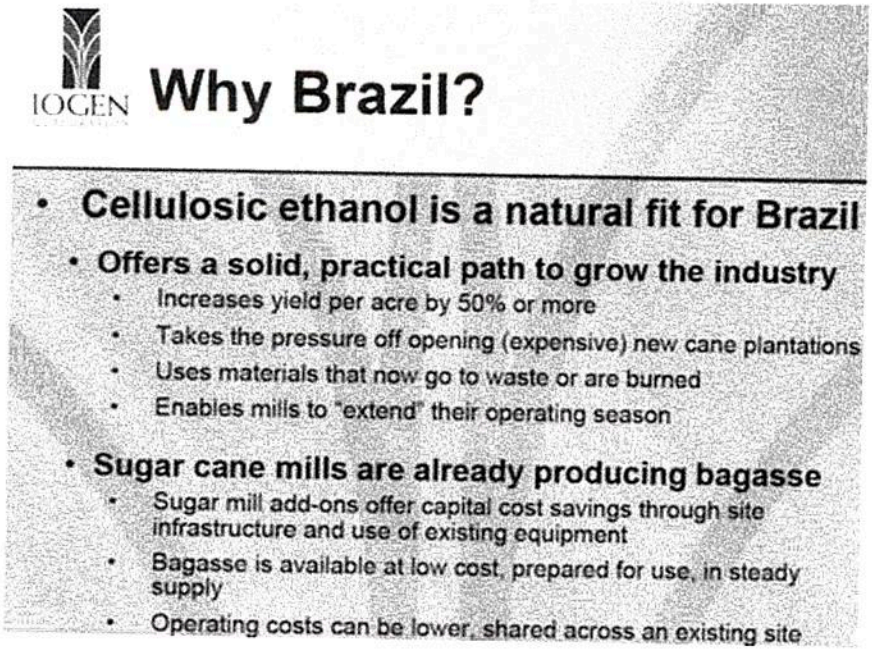
Iogen's pivot to bagasse

Iogen's switch in focus from Canada to Brazil for its first commercial project was a major news story in the past two years.

The rationale for bagasse can be summed up quickly: Raízen has a lot of it, and it is already aggregated and brought into the plant as part of the process for extracting cane juice from the cane. In other words, whether you are making sugar or ethanol, you have already paid to bring the bagasse into the plant.
But there's cane straw to be considered, too. In traditional manual harvesting, the cane trash is burned in the fields. With the decision by the Brazilian government to require mechanized harvest by 2017, there's been the question of what to do with all the straw.

How much? As a rough guide — and referring to dry tonnes — a cane field produces one third sugar, one third bagasse and one third tops and cane trash. Using that rough math, a 125 million (dry) tonne annual Brazilian cane harvest produces around 62 million tonnes each of bagasse and tops/cane trash. At 80-100 gallons per tonne, there's enough biomass in Brazil's current cane capacity (if all of it was used) for 10-12.5 billion gallons of ethanol, or 37-47 billion liters.

We put the practical figure at more like 40 percent of that – leaving the remainder to be used as biomass in the field for nutrient purposes, or burned for power generation.



The R8 and R9 technology

In many ways, the key decisions were taken in 2010, when Shell "announced a further investment in Iogen Energy, for the purpose of accelerating the commercial deployment of Iogen Energy's process for making cellulosic ethanol from agricultural residue. As part of the ongoing joint development agreement between Shell, Iogen Corporation and Iogen Energy, Shell made a significant incremental commitment to fund research and development activities at Iogen Energy until mid-2012."

At the time Iogen was using its R7 technology – the purpose of the new funding was to develop and demonstrate the R8 and R9 technology releases that were aimed at significantly reducing the capital and operating costs per gallon of cellulosic ethanol.

Indeed, this project checks in at $10 in capex per gallon — almost exactly the same capital cost that originally went into the 1 million gallon

Iogen's long, long journey

The roots of the technology date all the way back to 1975, when Patrick Foody Sr. initiated work on a "steam explosion" process to improve cellulose digestibility for use as animal feed1978 – US DOE contracts to investigate the performance of steam explosion for energy production. The process is found to deliver superior results compared with the prior state of the art pretreatments.
1980 – The company initiates research on enzymes and biotechnology.
1982 – The company builds an integrated 1 tonne per day cellulosic ethanol pilot plant, using wood as a feedstock.
1990 – Iogen enters the commercial enzymes business, focusing on producing enzymes that digest natural fiber. In 2013, Iogen sold its commercial enzyme business to Novozymes.
1991 – Iogen forms an alliance with Amoco for the development of cellulosic technology, ending in 1995 when Amoco terminated alternative fuels development.
1999 – With $15.8 million investment from Petro Canada and $10 million from Technology Partnerships Canada, Iogen initiates construction of the world's first demonstration-scale plant.
2002 – After a worldwide search for leading technology, Shell makes an initial commitment of $46 million to invest in developing Iogen cellulosic biofuel technology.

2004 – logen initiates commercial sale of cellulosic ethanol from its demonstration plant. Over the following years, logen invests in several rounds of demonstration plant upgrades, solving production scale-up issues.
2006 – Goldman Sachs invests $40 million in logen.
2007 – Volkswagen invests $10 million in logen, and studies the German potential.
2010 – Shell and Cosan announce the intent to form a Brazilian joint venture, and Shell transfers its holdings in logen Energy to Raízen.
2012 – Shell announces termination of its pursuit of a cellulosic ethanol project in Canada. 2013 – Raízen begins construction.

2014 – Completion of construction and start-up of ethanol production in Q4.

Tags: cellulosic ethanol, logen, Raizen

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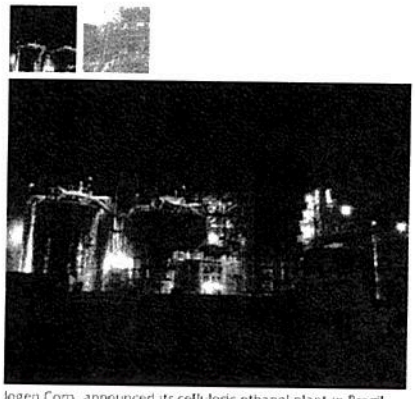
« US Senate passes tax extenders through 2014 only; biodiesel tax credit renewed, but will expire again in two weeks. Obama set to sign biofuel tax credit extender bill in coming days »

Iogen announces startup of Brazilian cellulosic ethanol plant

By Sue Retka Schill | December 17, 2014

Ottawa-based Iogen Corp. announced its first commercial-scale cellulosic ethanol plant is producing ethanol in Brazil. The first 200,000 liters (53,000 gallons) has been distributed by Brazilian ethanol producer, Raízen, to its network of gas stations, Ziyad Rahme, senior vice president and general manager of Iogen Energy, told *Biomass Magazine*.



Iogen Corp. announced its cellulosic ethanol plant in Brazil has begun operations.
Iogen Corp.

"We started commissioning at the end of October when construction was completed," Rahme said. "We are still in startup and shake down phase until the end of the month. Then, the way the sugarcane season works, they shut down now for the offseason as harvest ends. They'll start up again in the second quarter. We will ramp up to full production at that time." The company expects to be able to reach full nameplate capacity shortly after.

"Our startup has gone very well," he reported. "We're very pleased. We've done a lot of test work and validation here in Ottawa to build up the experienced needed to be able to do a quick startup when we went commercial. And that's what we're seeing."

Iogen announced the groundbreaking in late November 2013, for the $100 million, 40 MMly cellulosic ethanol plant colocated with Raízen's 80 MMly Costa Pinto sugarcane ethanol plant in Piracicaba, São Paulo, Brazil. Raízen handled the engineering and procurement functions for the project. "They did a fabulous job of keeping the project on schedule, delivering the construction on time. A year ago we targeted the fourth quarter 2014 for startup and it was a big accomplishment to be able to hit that," Rahme said.

Iogen has more than 10 years of testing and validation on its enzymatic hydrolysis process for cellulosic ethanol, beginning with straw and testing multiple feedstocks. When the partnership with the Brazilian sugarcane produce was struck, the company shipped 1,000 tons of sugarcane bagasse to the demo plant in Ottawa. "We spent six months here working with it. It had different mechanical and handling properties and the chemistry was a little different—not better, not worse, but different than wheat straw or corn stover," Rahme explained. "Our time at the demo plant was spent troubleshooting some of the problems we hadn't encountered before on the mechanical handling side, and then optimizing the chemistry of our process for bagasse. Finding the right set of condition for processing the material and adapting our designs for bagasse."

"Biofuel production at this facility represents the next step in our partnership with Iogen," said João Alberto Abreu, agroindustrial director from Raízen, in a statement accompanying the announcement. Raízen's initial commitment to Iogen came in July 2012. The company intends to deploy the technology in seven more sugarcane mills.

"Continuous commercial production will commence with the upcoming 2015 harvest season," said Pedro Mizutani, Raízen's executive vice president. "We plan to be producing up to 1 billion liters of cellulosic biofuel from bagasse and cane straw by 2024."

"We are very excited to have been able to make this start-up a success" said Iogen Corp. CEO Brian Foody. "We have a great team of engineers, scientists and operators who've been working tirelessly with Raízen's own excellent team. It has been a great partnership and we're very pleased to be collaborating with a major ethanol industry player and committed partner like Raízen

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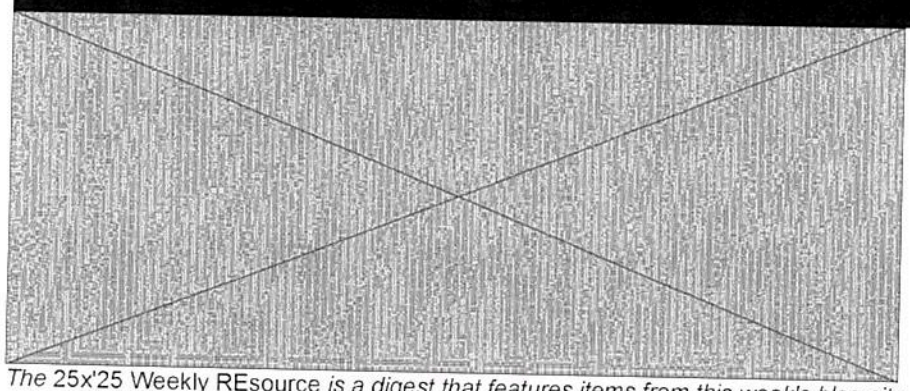

The 25x'25 Weekly REsource *is a digest that features items from this week's blog site, the* 25x'25 REsource, *and other sources. The* 25x'25 REsource *and the* 25x'25 Weekly REsource *complement the role of* 25x'25 *as an objective and trusted source of information on agricultural and forestry renewable energy and climate solutions. Also, visit us at our Facebook page and follow us on Twitter.*

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Our Featured Blog

Bioenergy Solutions Deserve a Major Role in U.S. Emission-Reduction Strategy

A broad survey of farmers has documented not only a yield boost from the use of cover crops in corn and soybeans, but indicates an increase in organic matter cover crops

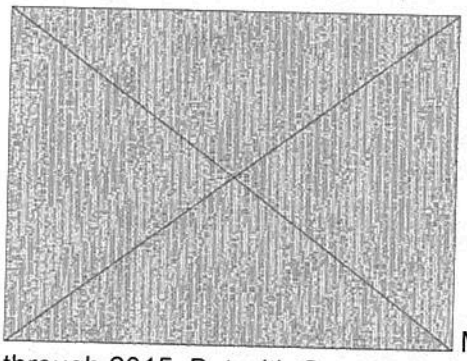
STAY CONNECTED

News of Note

Have in the soil. That means cover crops, as well as the conventional crops grown between cover crop rotations, retain more carbon in the soil. Given that cover crops are often used for renewable energy feedstocks, the survey is the latest in a long line of developments and disclosures that highlight the significant role crops grown to produce energy feedstocks play in the nation's carbon emission-reduction strategy. In the low carbon future that is still evolving, the greenhouse gas emission reduction benefits of biofuels as well as the carbon sequestration that is a co-benefit of biofuel feedstock production needs to be recognized and valued by federal regulators. Read more.

Senate Nearing Approval of Bill Extending Renewable Energy Tax Breaks

Final approval of a package of tax credit extensions, including many aimed at benefiting renewable energy, is expected to be the Senate's final matter of business before adjourning tonight or, more likely, tomorrow. The measure was passed by the House last week, 378-46, and only extends the credits, which expired at the end of 2013, through the end of this year.



Many in the Senate had called for an extension through 2015. But with Congress nearing adjournment (the House has already finished its business) and under pressure to pass a major spending bill to keep the government going through next September, as well as a major Defense Department authorization bill, Senate leaders said there was no time to fashion and debate a longer version with the House. The Senate was expected to spend most of today on the defense bill, followed by debate over how to proceed with the overall spending bill and a vote on that measure. Action on the tax credit extension measure was not expected until late tonight or tomorrow.

A bipartisan bill drafted last month extending many of the same tax credits for two years died in the face of a veto threat from the White House, where President Obama said too many of the credits helped corporations and not families. (We incorrectly reported last week the White House vetoed a bipartisan measure.)

A principal benefit included in the package expected to be sent to the White House this weekend is a wind energy production tax credit (PTC) that offers a credit of 2.3 cents per kilowatt-hour for the production of electricity.

Headlines of Note

***News of interest to our 25x'25 Partners and advocates for a clean energy future*:**

California Could Boost Renewable Energy Mandate

Duke Energy Plans to Invest $500 Million in Solar Power

EIA: New Ethanol Production Records Set, 2015 Forecast Increased

Ethanol Joins U.S. Fuels Dominating Global Market

Groundbreaking Technology Stores Wind Power in Salt Caverns

Lawmakers Frustrated at EPA over Ethanol Mandate Delay

Renewing America: How Can Biotechnology Benefit You?

The Energy Boom You Haven't Heard About: Wood Pellets

U.S. Solar Power Sector Booming

What's Really at Stake in the Florida Solar Battle?

While Germany Explores Energy Storage Tech at Breakneck Speeds, U.S. Not Far Behind

Renewable energy advocates have long complained that over the past several years, the "stop-and-start" nature of renewable energy tax credits, which Congress allows to expire after a short time, only to revive them later, sets back U.S. clean energy development.

But the short-term nature of the extension has been met with disappointment by wind energy leaders who said it would only be applicable to those facilities that start construction before the end of this year. Given the lack of a credit through most of 2014, wind energy development virtually stopped and industry leaders say the extension package, while retroactive to the beginning of 2014, is tantamount to giving developers only a few weeks to start new construction and benefit from the tax credit.

Tom Kiernan, president and CEO of the American Wind Energy Association, said the new Congress set to convene in January must move quickly to establish a longer term tax credit package that can insure investment and create jobs.

Other credits in the package extended through this year include a cellulosic biofuel producer tax credit of $1.01 per gallon and an additional, first-year 50-percent bonus depreciation for cellulosic biofuel production. A 30-percent credit for installation costs of alternative fuel refueling property; a biodiesel and renewable diesel credit of $1.00 per gallon; a 10-cents-per-gallon small agri-biodiesel producer credit; and a $1.00-per-gallon tax credit for diesel fuel created from biomass also expired at the end of the year and are in the pending legislation.

Upcoming Events

Events of interest to 25x'25 partners and other renewable energy stakeholders can be found by clicking **here**.

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U.S. Solar Installations Soar in Q3, Total Capacity Hits 17.5 GW

The Solar Energy Industries Association (SEIA) says the United States installed 1,354 megawatts (MW) of solar photovoltaics (PV) in the third quarter, up 41 percent more than the same period last year.

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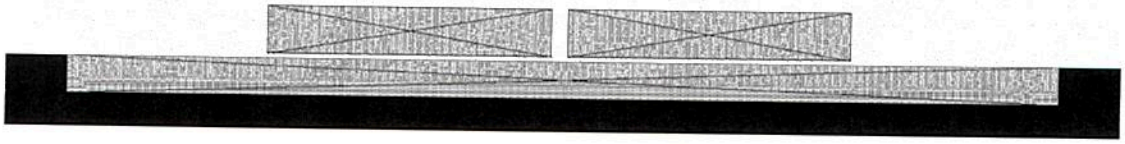
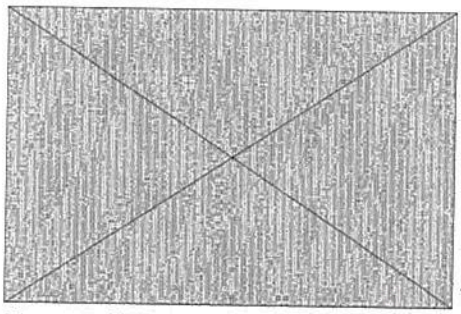




The numbers come from the latest edition of GTM Research and SEIA's U.S. Solar Market Insight Report, which was released this week.

According to the report, the third quarter was the nation's second largest quarter ever for PV installations and brings the country's cumulative solar PV capacity to 16.1 gigawatts (GW), with another 1.4 GW of concentrating solar power (CSP) capacity.

"Solar is proving to be an important and growing source of new generating capacity for the United States," says SEIA President and CEO Rhone Resch. "Through the first three quarters of the year, solar represents 36 percent of new capacity to come on-line, up from 29 percent in 2013 and 9.6 percent in 2012."

Resch cites "smart and effective public policies, such as the solar Investment Tax Credit (ITC), Net Energy Metering (NEM) and (state) Renewable Portfolio Standards (RPS). By any measurement, these policies are paying huge dividends for America. Every three minutes of every single day, the U.S. solar industry is flipping the switch on another completed solar project, benefiting both our economy and the environment."

The report tracks installations across three market segments: utility-scale, residential and non-residential which includes commercial, government and non-profit installations.

Historically, the U.S. utility-scale market segment has accounted for the majority of PV installations, and this past quarter continued the trend. The U.S. installed 825 MW of utility-scale projects, up from 540 MW in the third quarter last year.

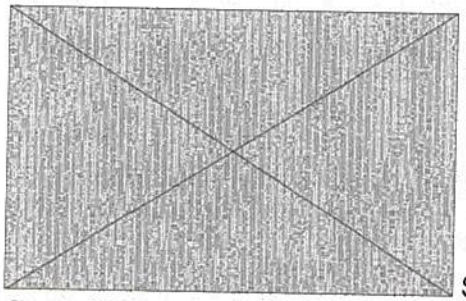
The growth marks the sixth straight quarter in which utility-scale PV has accounted for

more than 50 percent of the national total.

The U.S. residential market exceeded 300 MW in a quarter for the first time in history. Impressively, more than half of this total came online without any state incentive. Residential continues to be the most reliable market segment, now growing 18 out of the past 19 quarters. GTM Research forecasts it to exceed the non-residential segment in annual installations for the first time in more than a decade.

Efficiency Advocates Challenge Utility Efforts to Raise Fix Charges

Energy efficiency advocates say utilities are inappropriately seeking to raise monthly "fixed charges" to recover revenues lost to consumers using less electricity.



Seth Nowak, a senior analyst with the American Council for an Energy Efficient Economy (ACEEE), says in a recent blog that slow growth in electricity demand - or, in some places, flat or declining sales - and a growing number of customer-installed photovoltaic systems are creating concern among utilities about their ability to adequately recover the costs associated with producing electricity.

"In response, there has been a disturbing trend around the country of utilities proposing to simply raise monthly 'fixed charges,' or the charges we pay to the utility just for being a customer," Nowak says, noting that for residential customers, some utilities currently charging about $5-$10 per month for fixed customer charges are proposing to raise them to $20 dollars per month or more. Some 20 utilities currently have fixed-charge increase proposals before regulators.

Nowak says raising fixed charges limits customer control over energy costs in homes

and businesses, reducing the savings earned from using energy more efficiently. He says it also penalizes those who have already successfully invested in energy efficiency, and raises costs on those customers who use less electricity in the first place, such as those who live in apartments and small businesses. The analyst also makes the case that by weakening the incentive to invest in efficiency is bad for the economy and the environment, citing efficiency's role in creating jobs and reducing pollution.

"We recognize the need to design utility cost recovery and rates in a way that ensures that grid costs are fully and fairly recovered," Nowak said. But no matter the approach, cost recovery and rate design should be based on comprehensive analysis and maintain strong price signals to encourage efficient use of energy.

He calls on utilities to craft rate structure proposals that financially reward people and businesses that are saving energy.

Other alternatives cited by Nowak include revenue decoupling, where utility profits are no longer tied to the quantity of energy sales, and encourages energy efficiency. Frequent rate cases and financial reserves are additional ways to address revenue stability, he said.

If rate design changes are still needed - in addition to decoupling and frequent rate cases - there are better alternatives to higher fixed charges for all customers, including:

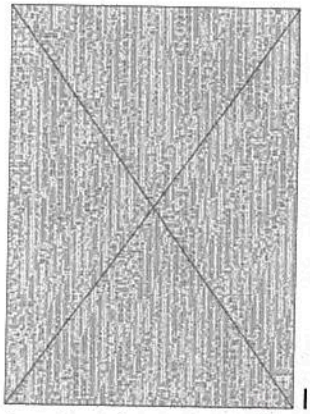
- Demand charges, which are based on each customer's contribution to the peak demand
- Time-of-use rates, which make the usage rate paid for electricity lower during times of low demand, such as in the middle of the night, and higher when there is more demand
- Minimum bills, which apply to the small number of customers below a certain low threshold of usage and guarantees the utility a minimum annual revenue from these customers.

"Whatever features are included in their plans, utilities would be wise to conduct a careful analysis of the estimated impacts of its proposed rate design changes on its

customers' energy consumption and energy bills. Simply raising fixed charges would be a huge shift in energy policy . . . and a change of this magnitude calls for careful analysis, Nowak says. "Utilities shouldn't take away customers' ability to control their electricity bills or dilute the benefits that energy efficiency brings to the nation."

Ethanol Industry Says CA's ILUC Analysis Must Reflect Real-World Data

Ethanol industry leaders are waiting for the California Air Resources Board to post its proposed updates to the state's Low Carbon Fuel Standard with the hope the new regulations will reduce the "penalty" imposed on ethanol shipped in from out of state for allegedly carrying higher carbon intensity due to indirect land use change (ILUC).



ILUC is a long-disputed theory advanced in 2008 that claims an increase in commodities grown here for use as energy crops forces the conversion of forests and grasslands overseas into cropland, losing the carbon sequestration properties of that land that existed prior to its conversion, thereby creating greater greenhouse gas emissions (GHGs).

Ethanol groups have protested ever since and offered studies to CARB that show ILUC is not a valid reason for the state to impose a "penalty" on out-of-state ethanol that makes it more difficult to use in the state's fuel supply.

CARB is expected to release its latest proposed revisions, possibly next week, based on recommendation made by the board's staff. The proposals will kick off a 45-day public comment period before they are finalized.

It's the latest round in which ethanol interests, including the Renewable Fuels Association (RFA), have called on CARB to "adjust" its current ILUC analysis "to better reflect real-world land use patterns." The RFA's latest evidence is a recently-released study from Iowa State University's Center for Agricultural and Rural Development (CARD) that, the RFA says, "exposes the implausibility of CARB's current ILUC predictions." The RFA called on the board to take into account the new CARD/ISU research and use it to immediately re-calibrate the agency's ILUC model.

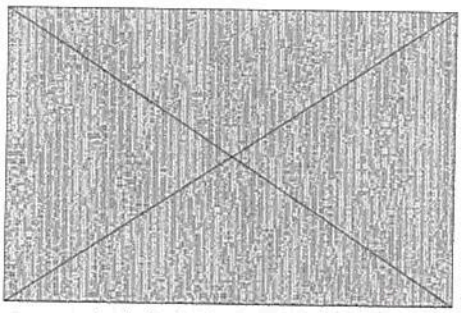
RFA Senior Vice President Geoff Cooper says the CARD/ISU study is "a remarkably important-and potentially game-changing-contribution to the debate over ILUC modeling." He said the study uses empirical data to conclude that "...the primary land use change response of the world's farmers in the last 10 years has been to use available land resources more efficiently rather than to expand the amount of land brought into production.

"This finding is not new," Cooper states. "However, this finding has not been recognized by regulators who calculate indirect land use."

The RFA and other ethanol interests say the CARD/ISU analysis demonstrates that CARB's ILUC results are inconsistent with real-world data and observed market behaviors in many regions. For example, ethanol advocates say, CARB's analysis suggests corn ethanol expansion caused conversion of forest and grassland to cropland in Canada, the European Union, Russia, Japan, China, and the United States - but in reality, cropland in those countries and regions had decreased or stayed the same over the past decade.

Biofuels are Answer to Reducing Global Transport GHG Emissions: GRFA

The Global Renewable Fuels Alliance (GRFA) reiterated this week that biofuels, including ethanol, are currently one of the most commercially viable, greenhouse gas (GHG) emissions reducing transport fuel alternatives to crude oil in the medium term.



GRFA, an advocacy group that represents 65 percent of the global biofuels production from 44 countries, issued its statement just as the latest UN framework convention for climate change was getting underway in Lima, Peru.

According to the GRFA, it is estimated that 25-30 percent of all global GHG emissions come from the transportation sector.

"Those GHGs need to be a priority if we are going to make a significant contribution to combating climate change. Biofuels must be an integral part of that fight," stated Bliss Baker, spokesperson for the GRFA.

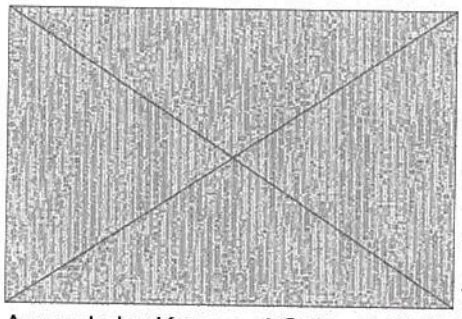
According to the association, biofuels are proven to reduce harmful GHGs from 40 to 90 percent when compared to fossil fuels around the world. For that reason alone, policies adopted in Lima must include the increased use of biofuels, Baker said.

Earlier this year, GRFA said 2014 global ethanol production would reach nearly 24 billion gallons and its use worldwide would reduce GHG emissions by nearly 117 million tons globally. (S&T)2 Consultants Inc., an internationally renowned energy and environmental consulting firm in partnership with the GRFA, produced data which showed that amount of GHG reductions is equal to removing over 21 million cars off the road annually.

"It's the same as removing the annual emissions from 14 average-sized coal-fired power plants," Baker said. "However, as the [International Energy Agency] has prescribed recently, more biofuels are needed to further reduce the emissions from the global transport sector."

KS, NE AGs Challenge EPA Ethanol Emissions Model

The attorneys general in Kansas and Nebraska have asked a federal appeals court to block new Environmental Protection Agency (EPA) regulations they say discourage the use of ethanol by requiring states to adopt conclusions about ethanol emissions not backed by scientific facts.



The lawsuit, filed in the D.C. Circuit Court of Appeals by Kansas AG Derek Schmidt and Nebraska AG Jon Bruning, asks the court to reject new EPA regulations that will require states to immediately begin using the MOVES2014 model in their State Implementation Plans (SIPs) for controlling pollutants governed by national air quality standards.

The suit argues that by implementing the MOVES2014 model without the opportunity for review and comment by the states and affected parties, the EPA forces states to measure emissions from ethanol-blended fuels in a way that incorrectly predicts higher levels of pollution.

The MOVES2014 model is based on an EPA-commissioned fuel study that is designed to analyze the emissions effects of different fuel parameters, including ethanol content. The suit alleges the model artificially and unnecessarily holds other fuel parameters constant. The so-called "match-blending" methodology, the suit alleges, unfairly targets ethanol and assigns disproportionate negative emissions effects. By dictating the use of the model, EPA effectively blocks states from encouraging the use of ethanol as part of their clean air plans, the attorneys general say.

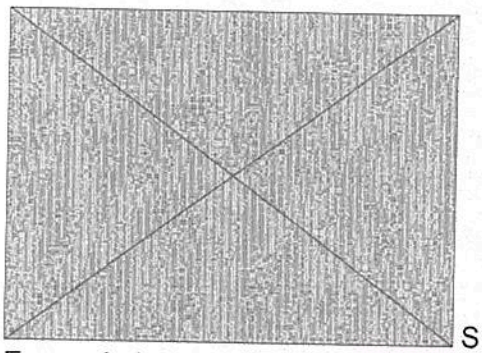
"Ethanol production is an important industry for Kansas and grain agriculture specifically," Schmidt said. "EPA's requirement that states use this faulty model was

unlawfully adopted without notice and opportunity for comment. This is an example of the EPA imposing its will on the states rather than working cooperatively toward the shared goal of cleaner air. We are asking that this model be rejected and replaced with a model that more accurately reflects the true emission effects of ethanol."

The case is State of Kansas, et al. v. U.S. Environmental Protection Agency, et al., in the U.S. Court of Appeals for the D.C. Circuit. The Energy Future Coalition and the Urban Air Initiative Inc. joined the attorney's general in filing the case.

New Maps Highlight Evolution of Land-Based Wind Potential in Southeast

Maps of current wind energy installations in the U.S. are mostly blank in the Southeastern states, but that could change with the ongoing technological advancements in wind turbines. As the lead organization for the Southeast Wind Energy Resource Center funded by DOE, the Southeastern Wind Coalition (SEWC) has created a new set of fact sheets to highlight the impact of those technology advancements on the potential for land-based wind energy in the Southeast.



SEWC partnered with the National Renewable Energy Laboratory (NREL) to create custom maps that show viable areas for wind projects based on past, present and expected future turbine technologies. Wind turbine tower heights are increasing, with current hub heights up to 110 meters and projected to increase to 140 meters in five to ten years.

"Typically wind speeds increase as height above the ground increases," said NREL Researcher, Owen Roberts. "This effect is particularly strong in portions of the Southeast which can cause taller turbine towers to be cost effective."

The length of turbine blades also affects performance and cost. Since 2000, average rotor diameters have increased by 83% according to a report by the Lawrence Berkeley National Lab.

"Longer blades allow a wind turbine to sweep a much larger area," said Jen Banks, Director of Operations at SEWC. "That improves energy capture and lowers energy cost."

Wind turbines were originally designed for the highest wind speed sites like the Great Plains and were not well-suited to some other regions. But the combination of these technology changes is making wind energy more economically viable in frontier areas like the Southeast.

"While not all of these areas can or will be developed, these maps show that land-based wind has the potential to provide extensive clean energy and economic development to the Southeast region," said American Council On Renewable Energy (ACORE) President and CEO Michael Brower.

The 11 states covered in the fact sheets (VA, NC, SC, GA, FL, KY, TN, MS, AL, AR, LA) have more than 110 facilities engaged in the wind industry supply chain despite minimal wind development.

"These fact sheets provide a great opportunity to inform decision makers about the wind industry assets that currently exist in the Southeast and to advance discussions regarding wind projects in the region," said Emily Williams, Manager of Industry Data and Analysis at the American Wind Energy Association.

A webinar will be held at 2 p.m. EST Dec. 18th to explore the data behind the maps and to discuss the implications for building the land-based wind industry in the Southeast. Please register for the webinar here.

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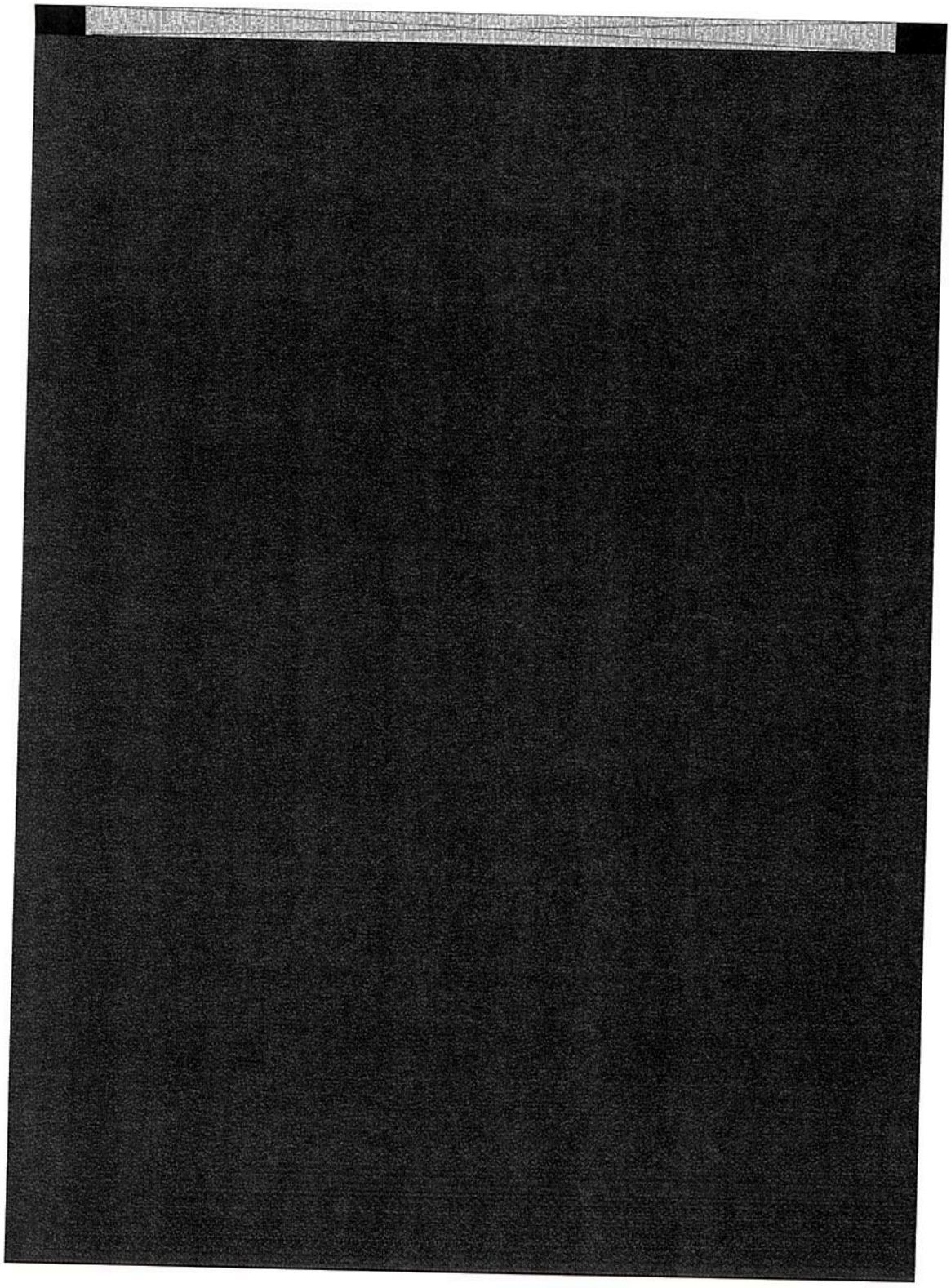

To: Hengst, Benjamin[Hengst.Benjamin@epa.gov]
From: Chris Hessler
Sent: Fri 12/5/2014 8:46:11 PM
Subject: Invitation: AJW Christmas Happy Hour

We are having a small gathering to celebrate the holidays, and inviting a few friends of AJW to join us. I certainly hope you can swing by. It would be good to see you and share a laugh (and a pint or two of Christmas cheer) before the end of the year.

AJW CHRISTMAS PARTY

Thursday, December 18
from 4:00 - 7:00 pm

Ireland's Four Courts
2051 N Wilson Blvd.
Arlington, VA 22201

Please join us for drinks and
hors d'oeuvres

Chris

Christopher Hessler

Partner

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202-460-0945 (M)

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2200 Wilson Blvd. / Suite #310 / Arlington, VA 22201

AJW's work focuses on enhancing market opportunities and removing market barriers for innovative technologies.